

SSTS Advanced Designer and Inspector Task Analysis

Subsurface Sewage Treatment System (SSTS) Program

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Advanced Designer and Inspector Task Analysis			
I.	Become certified as an Advanced Designer and/or Inspector		
	I.A	Complete training	
	I.B	Pass certification exam	
	I.C	Apply for certification	
	I.D	Complete continuing education	
II.	Obtain Advanced Design and/or Inspector business license		
III.	Complete preliminary site evaluation as a part of a site suitability assessment		
	III.A	Communicate with client about desires and preferences	
	III.B	Contact local unit of government	
		III.B.1	Obtain legal description of property, including Township, Range, and Section
		III.B.2	Determine property lines, easements, and proposed or existing improvements
		III.B.3	Determine location and status of proposed or existing water supply wells and pipes in vicinity
		III.B.4	Determine requirements and scope of preliminary and field evaluation activities and design report submittal and review process
	III.C	Determine SSTS flow	
		III.C.1	Estimate flow for SSTS serving existing dwelling or group of dwellings
		III.C.2	Estimate flow for SSTS serving new developments
		III.C.3	Estimate flow for SSTS serving other establishments
		III.C.4	Determine flow for SSTS serving other establishments using measured flow
	III.D	Determine anticipated effluent concentrations of BOD, TSS, & FOG and characterize waste strength	
		III.D.1	Assess waste suitability (domestic, non-domestic - suitable for discharge into soil, non-domestic - not suitable for discharge into soil, hazardous)
		III.D.2	Identify challenging waste streams (inhibitors to treatment)
		III.D.3	Determine necessity for source segregation due to waste characteristics
	III.E	Complete preliminary evaluation activities	
		III.E.1	Determine applicable setbacks
		III.E.2	Locate the system(s) and the surrounding one-mile area on a USGS quadrangle map
		III.E.3	Assess risk due to aquifer sensitivity to Nitrogen
		III.E.4	Asses risk due to surface water impact from phosphorus
		III.E.5	Determine permit type based on flow and Class V requirements
			III.E.5.1 Confirm authorization to perform advanced design/inspection activities
	III.F	Assess total risk based on preliminary site report	
IV.	Complete field evaluation as a part of site suitability assessment		
	IV.A	Contact Gopher One and locate utilities	
	IV.B	Investigate property	
		IV.B.1	Establish lot lines to satisfaction of owner or local unit of government
		IV.B.2	Identify, locate, and mark improvements, setbacks, & easements
		IV.B.3	Investigate site for initial soil treatment area and reserve land area
	IV.C	Identify surface features and soils characteristics for initial and reserve land area soil treatment area location, size, and depth	
		IV.C.1	Provide general evaluation of soil dispersal area: geomorphic description, current and past land use
		IV.C.2	Identify the uniformity of the soil over the site
		IV.C.3	Conduct hydraulic conductivity tests for MSTs
			IV.C.3.1 Use double ring infiltrometer
			IV.C.3.2 Use permeameter
			IV.C.3.3 Use other acceptable and/or necessary testing protocol
		IV.C.4	Determine soil organic loading rate estimate
		IV.C.5	Determine loading rate & absorption area size based on the more conservative estimate of hydraulic or organic loading needs

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		IV.C.6	Assess site suitability
			IV.C.6.1Determine acceptable contour loading rate (CLR)
			IV.C.6.2Identify possible system configurations
	IV.D	Evaluate system(s) flow	
		IV.D.1	Install a method of measuring daily flow for at least 90 days for an other establishment
	IV.E	Assess waste strength	
		IV.E.1	Measure waste strength in acceptable manner
V.	Conduct pre-design		
	V.A	Prepare and submit soil and site report to local unit of government	
		V.A.1	Prepare detailed site map with two-foot contours
			V.A.1.1Define benchmark, location and elevations of all soil pits, borings, hydraulic tests, limiting condition, proposed system bottom depth, and system site boundaries
		V.A.2	Prepare and submit all preliminary and field evaluation documentation to local unit of government
		V.A.3	Document any difficulties encountered during site evaluation
		V.A.4	Assess risk (obstacles to effective treatment) based on preliminary and field evaluation report
			V.A.4.1Document potential for groundwater mounding
			V.A.4.2Document potential for surface water impact from phosphorus
			V.A.4.3Document potential for groundwater impact from nitrogen
	V.B	Determine if a variance is necessary and warranted	
	V.C	Interpret site and soil information for suitability of MSTs siting, design, and construction	
	V.D	Communicate with client about suitable system options	
VI.	Create design report		
	VI.A	Use preliminary and site evaluation to determine advanced design specifications	
		VI.A.1	Use depth to limiting layer in conjunction with treatment level to choose treatment system
			VI.A.1.1Account for rock fragments
			VI.A.1.2Identify if reduced vertical separation is necessary and warranted
		VI.A.2	Use texture and structure or percolation rate in conjunction with treatment level to determine absorption area (hydraulic) loading rate for ISTS
			VI.A.2.1Identify if increased hydraulic loading rate is necessary and warranted
		VI.A.3	Use texture and structure along with hydraulic tests in conjunction with treatment level to determine absorption area (hydraulic) loading rate for MSTs
			VI.A.3.1Identify if increased hydraulic loading rate is necessary and warranted
		VI.A.4	Use texture and structure in addition to hydraulic conductivity test results to determine acceptable system geometry (Contour Loading Rate)
		VI.A.5	Determine final flow values for system(s) and components
		VI.A.6	Define SSTS classification and type
		VI.A.7	Determine appropriate application of design considerations to mitigate risks
			VI.A.7.1Specify design requirements to mitigate non-domestic waste sources
			VI.A.7.2Specify design requirements to mitigate high-strength waste
			VI.A.7.3Specify design requirements to mitigate variation in flow
			VI.A.7.4Specify design requirements to mitigate high risk site conditions
			VI.A.7.5Specify design requirements to mitigate high risk soil conditions
			VI.A.7.6Specify design requirements to mitigate small lot conditions
			VI.A.7.7Specify design requirements to mitigate groundwater mounding that interferes with treatment
			VI.A.7.8Specify design requirements to mitigate conditions that threaten surface water (P removal)
			VI.A.7.9Specify design requirements to mitigate sensitive aquifers (N removal)
	VI.B	Identify special design parameters for graywater, Type II & Type III systems with use of registered Type IV products	
		VI.B.1	Identify how use of a graywater system will impact design
		VI.B.2	Identify how placing a system in floodplain will impact design (Type II)
		VI.B.3	Identify how placing a system in cut, filled or compacted soils will impact design (Type III)
		VI.B.4	Identify how down-sizing a system will impact design (Type III)
		VI.B.5	Identify how placing a system in less than 12" unsaturated soil will impact design (Type III)

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	VI.C	Determine design specifications for collection system	
		VI.C.1	Design collection system ≤ 2500 gpd
			VI.C.1.1Design STEP - septic tank effluent pressure
			VI.C.1.2Design grinder collection
		VI.C.2	Design collection system between 2501 - 10,000 gpd
			VI.C.2.1Design gravity collection
			VI.C.2.2Design gravity collection with lift stations
			VI.C.2.3Design STEG - septic tank effluent gravity collection system
			VI.C.2.4Design STEP collection system
			VI.C.2.5Design grinder collection system
		VI.C.3	Design for inflow and infiltration (I&I)
	VI.D	Determine design specifications for tank(s) using MN Rules Chapter 7080-7081, registered sewage tanks list, and design guidance documentation	
		VI.D.1	Design septic tank size and features per manufacturer recommendation and product registration guidance
		VI.D.2	Specify septic tank and stilling tank design requirements for SSTs between 2501 and 10,000 gpd
		VI.D.3	Specify storage capacity design requirements for SSTs between 2501 and 10,000 gpd using flow equalization
		VI.D.4	Specify recirculation tank design requirements
		VI.D.5	Specify grease trap design requirements
		VI.D.6	Specify pump tank(s) design requirements for SSTs between 2501 and 10,000 gpd
		VI.D.7	Calculate potential for tank flotation and specify restraint options when appropriate
		VI.D.8	Specify tank testing and management requirements
	VI.E	Determine design specifications for treatment system	
		VI.E.1.	Choose registered pretreatment device most suited for the application
			VI.E.1.1Properly incorporate proprietary registered treatment product into treatment train based on understanding of design principles and applications
			VI.E.1.2Design single pass sand filter between 2501 and 10,000 gpd per MPCA design guidance and RSG
			VI.E.1.3Design recirculating sand filter between 2501 and 10,000 gpd per MPCA design guidance and RSG
			VI.E.1.4Specify installation requirements per manufacturer and product registration guidance
			VI.E.1.5Understand design principles and site conditions in which constructed wetlands are appropriate
		VI.E.2	Design trench treatment system with Type IV pretreatment between 2501 and 10,000 gpd using registered distribution media
		VI.E.3	Design bed treatment system with Type IV pretreatment between 2501 and 10,000 gpd using registered distribution media
		VI.E.4	Design at-grade treatment System with Type IV pretreatment between 2501 and 10,000 gpd using registered distribution media
		VI.E.5	Design mound treatment system with Type IV pretreatment between 2501 and 10,000 gpd using registered distribution media
		VI.E.6	Understand design principles and site conditions in which drip distribution is appropriate
	VI.F	Determine design specifications for groundwater mound height monitoring for MSTs	
	VI.G	Determine design specifications for pump & distribution system	
		VI.G.1	Design supply pipe to registered treatment product and distribution system
		VI.G.2	Design pump specifications & dosing volumes
			VI.G.2.1Design demand dosed distribution
			VI.G.2.2Design timed dose distribution
			VI.G.2.3Design for flow equalization
			VI.G.2.4Design specifications for multiple pumps
		VI.G.3	Design uniform distribution system
			VI.G.3.1Design level pressure distribution
			VI.G.3.2Design non-level pressure distribution
			VI.G.3.3Design flow-splitting/zoned distribution system
			VI.G.3.4Design loading and resting schedule for cells and zones within distribution system based on hydraulic and organic loading rates

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	VI.H	Determine site layout	
		VI.H.1	Specify component elevations and locations on site map relative to defined benchmark
		VI.H.2	Verify chosen contour loading rate and system geometry
	VI.I	Complete and submit design report	
		VI.I.1	Write and submit management plan for all systems
		VI.I.2	Write and submit operation and maintenance manual for all MSTs
		VI.I.3	Confirm applicable rules and regulation compliance with certified signature
		VI.I.4	Submit all required design documents to local authority for review, revision, and approval
		VI.I.5	Confirm operating permit requirements as written by permitting authority
		VI.I.5.1	Ensure design specifications allow for the completion of required sampling
	VI.J	Provide construction oversight	
		VI.J.1	Observe critical periods of MSTs construction
		VI.J.2	Prepare and submit report of observed MSTs construction activities prior to final inspection
		VI.J.3	Provide start-up oversight
VII.	Conduct new and existing Advanced Inspector activities		
	VII.A	Complete new system Inspector activities	
		VII.A.1	Review design report for accuracy and completeness
			VII.A.1.1 Request changes prior to permit issuance
			VII.A.1.2 Approve report and issue construction permit
		VII.A.2	Conduct new system inspection
			VII.A.2.1 Use locally developed or U of M New Inspection Report Form
			VII.A.2.2 Issue Certificate of Compliance or require changes to meet compliance
		VII.A.3	Develop operating permit required management activities and frequencies
			VII.A.3.1 Define reporting requirements
			VII.A.3.2 Verify system meets operating permit requirements
			VII.A.3.3 Confirm permit holder is aware of responsibilities and renewal process
		VII.A.4	Maintain records with local unit of government in a manner that facilitates compliance management
	VII.B	Conduct existing system inspection	
		VII.B.1	Complete MPCA Existing SSTS Inspection Form
		VII.B.2	Complete all local requirements
		VII.B.3	Issue Certificate of Compliance or Notice of Noncompliance
		VII.B.4	Resolve soil disputes per locally defined procedures
		VII.B.5	Submit inspection report to local program and system owner within 15 days of inspection
	VII.C	Confirm applicable rules and regulation compliance with certified signature	